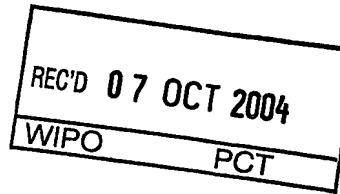




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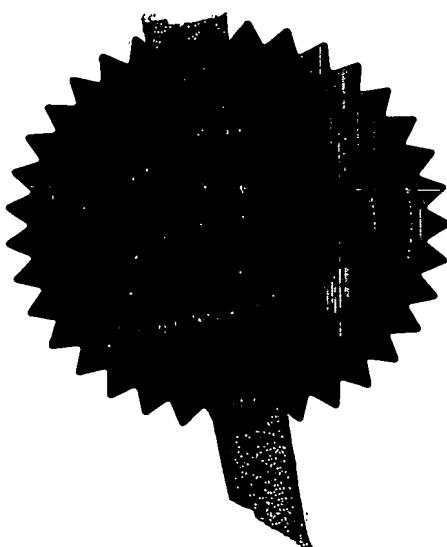
The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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Dated 17 September 2004

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Your reference Check Stock (UK)

0321429.3

The  
**Patent  
Office**

Request for grant of a  
Patent

Form 1/77      Patents Act 1977

## 1 Title of Invention

Check stock security device

## 2. Applicant's details



First or only applicant

2a. If applying as a corporate body: Corporate Name  
EnSeal Systems Limited

## Country

GB

2b. If applying as an individual or partnership  
Surname

Forenames

2c. Address      6 Thorney Leys Business Park  
                    Witney  
                    Oxford

UK Postcode      OX8 7GE

Country      GB

ADP Number

8321271001

**7 Inventorship**

The applicant(s) are the sole inventors/joint inventors

Yes No **8 Checklist**

Continuation sheets 0

Claims 1 /

Description 3 /

Abstract 1 /

Drawings 0

Priority Documents Yes/No

Translations of Priority Documents Yes/No

Patents Form 7/77 Yes/No

Patents Form 9/77 Yes/No

Patents Form 10/77 Yes/No

**9 Request**We request the grant of a patent on the basis  
of this applicationSigned: *Origin Limited*

(Origin Limited)

Date: 12 September 2003

<input type="checkbox"/>	Second applicant (if any)
2d	Corporate Name
Country	
2e	Surname
Forenames	
2f	Address
UK Postcode	
Country	
ADP Number	
3 Address for service	
Agent's Name	Origin Limited
Agent's Address	52 Muswell Hill Road London
Agent's postcode	N10 3JR
Agent's ADP Number	C03274 <i>7270457002</i>

**4 Reference Number**

Check Stock (UK)

**5 Claiming an earlier application date**

An earlier filing date is claimed:

Yes No Number of earlier  
application or patent number

Filing date

15 (4) (Divisional)

8(3)

12(6)

37(4)

**6 Declaration of priority**

Country of filing	Priority Application Number	Filing Date

## Check Stock Security Device

### Background

In recent years there have been many methods proposed to authenticate checks. One type of authentication already used is the Positive Pay system where a list is made of all issued checks and despatched to the reconciling Banks. This system detects any falsification after the checks have been despatched from the Bank of First Deposit to the issuing Bank.

A more recent version of this system is described in US6,464,134 (Page, not assigned) where the details of issued checks are sent to a central processing agency to which check cashing outlets have on line access. The central agency confirms that the details on the check correspond to those stored at the time of issue.

A second type of authentication has avoided the necessity of issue files by adding coded data to the check itself which will verify the human readable data.

Abathorn(EPO 699,327B1) select at least two critical items of data and encode them into machine readable form so that verification may be carried out by comparing the machine readable and human readable data. They do not indicate any encryption and it appears that the encoding is in a standard form so that no access will be required to encryption or hashing keys.

ASDC (US 6,233,340) describe a method of authentication in which check variable data is irreversibly encrypted and added to the check in machine readable form such as a bar code. Verification is by regenerating the same machine readable code and comparing the two versions. The keys for encryption have to be known to both encryptor and validator and this fact makes it a less suitable schemes for distributed validation. In a later patent (US 6,549,624) the use of asymmetric (public/private) encryption is proposed thus adding a level of security which would be more appropriate for remote check cashing facilities. In this patent the encrypted data is decrypted to compare it with the human readable data. A PIN may be added to the encoding to allow verification of payee identity at the time of transaction.

ChequeGuard (US6,073,121) also propose that all of the check data be encrypted and encoded into a machine readable symbol placed above the MICR line. Again verification is by decoding the symbol and comparing with original data. The encryption keys are notified to Banks and businesses in advance.

Payformance (US 6,170,744) describe a similar method of hashing data with the added security of a digital signature, all encoded into a graphical symbol. However, in a pair of more recent patent applications (US20020174334A1, US20020174074A1) the data which is hashed includes a personal identifier to allow for verification of identity at POS. In this case, the key for hashing can either be accessed on line at the check cashing outlet or else a verification authority is available online to carry out the process. Also the hashed data is added to the MICR line so that it may be humanly readable or read by a MICR reader, dispensing with the need for scanners and imaging technology.

In all of these methods there is a selection of data which is encoded for verification. The data may be in plain form or encrypted or hashed, and in some cases a digital signature is added for extra security. The handling of the security keys is a prime concern. Where the keys have to be distributed prior to any transaction the method is less appropriate for wide distribution. The problem can be offset to some degree by a public/private key scheme. Another alternative is the use of online access to keys or decryption services.

#### Summary of Invention

The object of the present invention is to provide a higher level of security for checks as in the aforementioned patents but by a method designed to be more appropriate for transactions at check cashing outlets or POS. The improvement arises from the inclusion of a graphic on the original check stock which contains the key to the data hashing algorithm used for the check data.

This compares with the prior art where the key is either (a) predistributed (b) part of a public/private key scheme (c) available on line or (d) available to a service provider who is on line.

Thus according to the invention the authentication will be available without any recourse to on line facilities and hence can be available for remote agencies.

In one implementation, when the check stock is printed a graphic will be included which contains in encoded form some or all of the account number, the bank routing number, the range of check numbers, a PIN and a key. The graphic can be in any machine readable form such as a conventional 1 or 2D barcode or more sophisticated symbologies, such as those available from Enseal Systems Limited and disclosed in PCT/GB02/00539 may be used.

If a cashier issues a check containing such a graphic a hash is calculated from at least the payee and amount, the hash depending on the key encoded in the graphic. This hash is printed onto the MICR line in the allowable positions in the form of a 4 digit number. Alternatively it may be handwritten or printed in any available part of the check.

When such a cashier's check is presented at a POS or other transaction agency, the graphic is scanned to retrieve the key and the same data as used at issuance is hashed using that key. The number that is obtained is compared with the hash value previously added to the MICR line.

The process of verification can be further automated by retrieving the data on the check by analysing the scanned image and using OCR techniques to interpret the human readable text and the MICR line data.

In an alternative implementation where an individual wishes to write a check on his own account he may use check stock, printed as described with a data bearing graphic, where the graphic also contains a PIN number known only to that individual. When such a check is presented the individual is able to confirm his identity by typing in his PIN to a key pad where its validity will be confirmed by software which will decode the PIN from the graphic by analysing a scanned image of that graphic.

**Claims**

1. A method of authenticating check data at a point remote from the issuing bank by:
  - (a) encoding a key onto check stock in the form of a graphic;
  - (b) at the time of issue using the encoded key to hash a selection of check data which may include the payee and amount and which also appears in human readable form;
  - (c) adding the hashed data to the MICR line of the check or to some other allowable area in accordance with the bank conventions for MICR data;
  - (d) at a point of transaction, scanning the check and analysing the image to decode the key;
  - (e) reading the human readable or machine readable data;
  - (f) submitting manually or automatically the human readable data, the key and the hash value from the MICR line to a processor ;where the processor recalculates the hash from the given data using the given key and confirms or otherwise that the recalculated hash is the same as the encoded hash.
2. Similar above where the encoded data includes a PIN or some form of personal identification and the customer enters the PIN in a key pad at the time of transaction.
3. For various selections of data.
4. Where the data is automatically read from the check at time of verification by using OCR techniques on the human readable and MICR data in the scanned image of the check.
5. Where the data is keyed in manually.

**Abstract:****Check Stock Security Device**

This patent concerns a method of enhancing the security of the check cashing operation at locations remote from the issuing bank. A data bearing graphic is printed on the check stock at the time of the initial printing, the data comprising at least account identifying information and a key. When a check is issued the payee and amount at least are hashed using the key decoded from the graphic and the hashed value is added to the check, possibly on the MICR line. At POS or a bank teller the key is decoded from the graphic, the check data is rehashed and compared with that on the MICR line. A PIN may also be included in the graphic to allow checking of ID at the POS or teller station.

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